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1. A gantry for use in the construction process of bridges, viaducts and other structures, said gantry comprising:
  - 5 a main structure;
  - at least one unbonded cable;
  - a first anchorage for securing one end of said unbonded cable to the said structure and a second anchorage for securing the opposite end of said unbonded cable to the said structure;
  - 10 **characterized in that** there is provided at least one sensor unit capable of measuring a physical variation in the said main structure indicative of loading or internal forces of the main structure, an electronic interface converting said measurements into readable data and providing said data to a controller; and an actuator which rests permanently between said main structure and said unbonded cable adapted to vary the tension of said unbonded
  - 15 cable according to said controller, such that said tension is increased in response to increased loading or internal forces of said main structure, or decreased in response to decreased loading or internal forces of said main structure.
2. A gantry according to claim 1, **characterised in that** the said controller is at least a  
20 computer or automaton capable of running at least a computer program or processing code.
3. A gantry according to claim 1 and 2, **characterised in that** the said computer program or processing code is capable of reading the said data transmitted by the said sensor and  
25 calculating the intensity and/or direction of the force to be applied by the said actuator on the said unbonded cable.
4. A gantry according to claim 1, **characterised in that** the said controller is a human  
30 operator controlling manually a switch board connected to the said at least one actuator.
5. A gantry according to claim 1, **characterised in that** the said unbonded cable can be internal or external to the contours of said main structure.
6. A gantry according to claim 1 and 5, **characterised in that** said unbonded cable has a  
35 linear or multi-linear layout.

7. A gantry according to claim 1, **characterised in that** the tension of the said unbonded cable is increased or decreased by the said actuator as a result of the movement of the anchorage away or towards, respectively, in relation to the said main structure

10. A gantry according to claim 1, **characterised in that** said actuator is at least one extendable strut with a first end removably connected to a saddle that supports the said unbonded cable and a second end removably connected to said main structure.

11. A gantry according to claim 1 and 10, **characterised in that** the strut or struts which support said saddles are retractable or movable, by translation or rotation.

12. A gantry according to claim 1, **characterized in that** said or each sensor is located in the neighbourhood, on the surface or interior of the elements of the gantry, or is external to the said main structure.

13. A gantry according to claim 1 and 12, **characterized in that** said sensor is an extensometer, pressure transducer a LVDT, a laser sensor, a charge cell, an inclinometer, a piezometric sensor or similar device.

14. A gantry according to any of the preceding claims, **characterized in that** said data measured by the said or each sensor useful for the calculation of the said intensity and/or direction of the forces to be applied by the actuator are at least pressures, deflections, rotations, deformations, stresses or load levels.

15. A gantry according to any of the preceding claims, **characterized in that** the transmission of said readable data between said sensor and said controller and the transmission of said processed data between said controller and said or each actuator is done by electronic circuit, optic-fiber communication, radio frequency, infrared, WI-FI or BlueTooth™ technology.

16. A gantry according to claim 1, **characterised in that** it is capable of providing support for formwork (*in situ* casting structures) or for precast segments, precast girders, or even for other material structural elements.

5 17. A method for providing a pre-existing gantry with a self-adjusting prestressing system, **characterized in that** the said pre-existing gantry is equipped with the elements of claim 1.